BICLE: The Decentralized Feed Protocol

Version: 0.1
Date: November 7, 2025
Status: Experimental Release

Abstract

BICLE is a decentralized information protocol that creates an immutable, transparent, and verifiable news curation and record network. Inspired by Bitcoin's architecture, BICLE proposes a Proof-of-Information (PoI) model that uses cryptographic hashes to ensure the integrity of news items. This protocol marks the beginning of a revolution in how information is disseminated, verified, and consumed.

Like Bitcoin decentralizes money, BICLE decentralizes truth.

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1. Introduction

1.1 The Problem

The modern internet suffers from fundamental centralization:

- **Editability**: News can be silently altered or deleted
- **Manipulation**: Narratives are controlled by platform algorithms
- **Censorship**: Information disappears without trace
- **Lack of Proof**: No cryptographic evidence of "what was said when"
- **Single Points of Failure**: Platforms control distribution

Traditional journalism relies on trust in institutions. But institutions can be compromised, pressured, or corrupted. There exists no immutable, public record of information that anyone can verify.

1.2 The Solution

BICLE creates an **immutable ledger of information** using blockchain technology:

- Every news item gets a unique cryptographic hash (iHash)
- News items are grouped into blocks
- Blocks are chained together cryptographically
- The entire history is verifiable and tamper-proof
- No central authority controls the record

Core principle: If it's in BICLE's blockchain, it happened. It's timestamped. It's verifiable. It's permanent.

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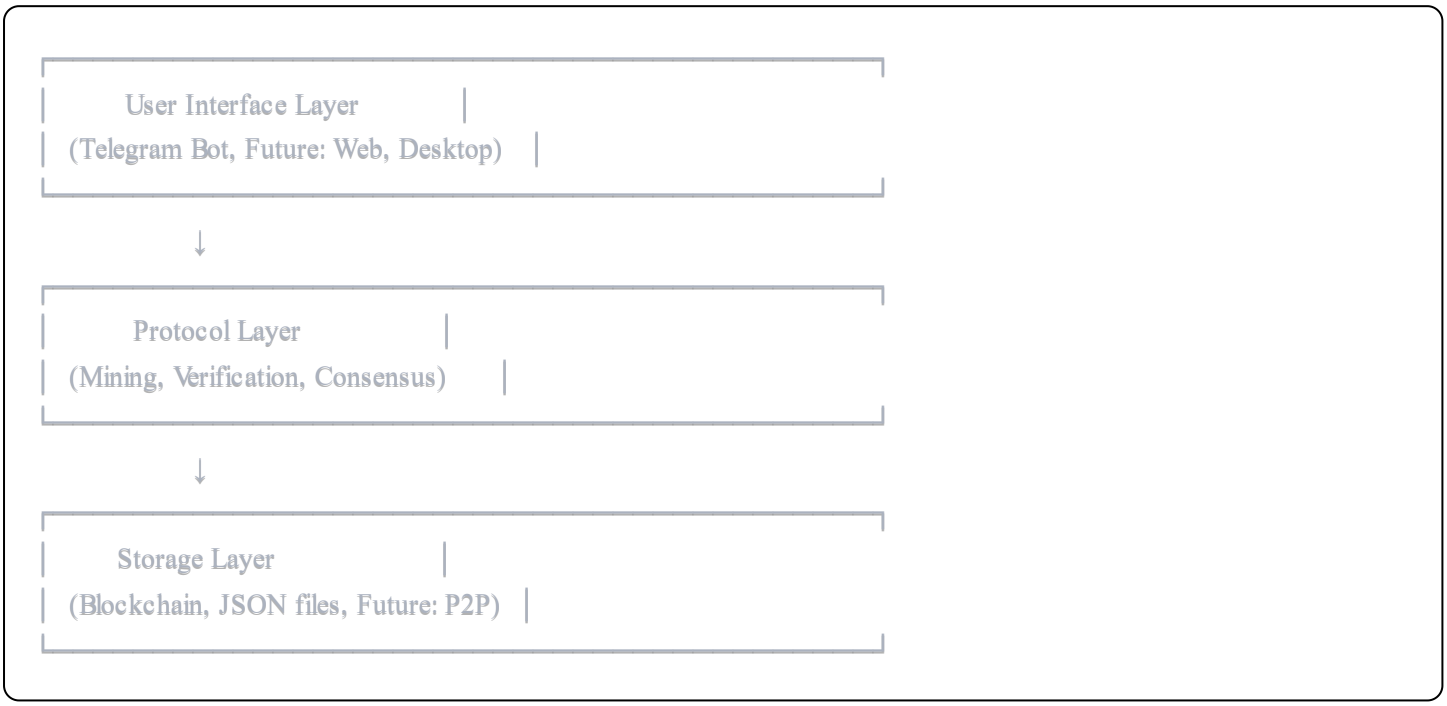
2. Technical Architecture

2.1 System Components

BICLE consists of three main layers:



2.1.1 BICLE Node

The BICLE node is software that:

- Fetches news from RSS feeds and community submissions
- Creates cryptographic proofs (iHash) for each news item
- Mines new blocks containing verified news
- Maintains the local blockchain
- Communicates with other nodes (future versions)

2.1.2 Node Network

Currently (v0.1), future versions will implement:

- Peer-to-peer communication
- Distributed consensus
- Blockchain synchronization
- Redundancy and fault tolerance

2.1.3 User Interface

v0.1 uses Telegram as the interface:

- Command-based interaction
- Real-time block notifications
- Community news submission
- Blockchain export for auditing

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3. Proof-of-Information (PoI)

3.1 Concept

Unlike Bitcoin's Proof-of-Work (computational puzzles), BICLE uses **Proof-of-Information**:

- **Input**: News content (title, link, source, timestamp)
- **Process**: SHA-256 hashing
- **Output**: Unique identifier (iHash)

3.2 iHash (Information Hash)

Each news item receives a unique hash:

```
iHash = SHA256(title + link + source + published_date)
```

Properties:

- Deterministic: Same input always produces same hash
- Unique: Different news = different hash
- Collision-resistant: Practically impossible to find two news with same hash
- One-way: Cannot reverse hash to get original content

Example:

```
Title: "The Guardian 05/Nov/2025 - AI bubble fears"
Link: "https://www.theguardian.com/..."
Source: "The Guardian"
Date: "2025-11-05"

iHash: a7f3c9e2d1b4f8a6e5c3d9b2f4a8e6c1...
```

3.3 Block Structure

Multiple news items are grouped into blocks:

```json
{
  "block_number": 1,
  "timestamp": "2025-11-06T14:30:00Z",
  "news": [
    {
      "title": "...",
      "link": "...",
      "source": "...",
      "published": "...",
      "summary": "...",
      "iHash": "a7f3c9e2..."
    },
    // ... more news
  ],
  "blockhash": "b8d4e3f1...",
  "previous": "c9e5f2a3..."
}
```

3.4 Block Hash

The block hash is computed from all iHashes:

```
blockHash = SHA256(sorted(iHash1 + iHash2 + ... + iHashN))
```

This creates a **chain of custody**:

- Each block points to previous block's hash
- Changing any news would change its iHash
- Changing any iHash would change the blockHash
- Changing any block would break the chain

Result: Tamper-evident blockchain.

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4. Genesis Block

The BICLE blockchain begins with **Block 0** (Genesis Block):

```json
```

```
{
  "block_number": 0,
  "timestamp": "2025-11-05T11:20:00Z",
  "news": [{
    "title": "The Guardian 05/Nov/2025 - on the brink of a financial crisis for AIs in companies",
    "link": "https://www.theguardian.com/business/2025/nov/05/...",
    "source": "The Guardian",
    "published": "2025-11-05",
    "summary": "Global stock markets fall sharply amid fears of an AI-driven financial bubble collapse.",
    "iHash": "..."
  }],
  "blockhash": "...",
  "previous": null
}
```


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5. Current Features (v0.1)

5.1 News Aggregation

- Fetches from 24+ RSS sources (tech-focused)
- Accepts community submissions via `/submit`
- Deduplicates based on iHash

5.2 Blockchain Storage

- JSON-based storage (easy to audit)
- Automatic persistence
- 30-day history retention for sent news

5.3 Integrity Verification

- `/verify` command checks entire chain
- Validates all previous hashes
- Validates all blockhashes
- Reports corruptions

5.4 Distribution

- Posts blocks to Telegram channel

- Auto-mining every 5 minutes (configurable)
- Manual mining via `/mine` command

5.5 Auditing

- `/export` command generates full blockchain JSON
- Anyone can verify the data independently
- Open source code for full transparency

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6. Philosophy: Why Centralized Sources?

6.1 The Apparent Contradiction

Critics might ask: *"If BICLE aims for decentralization, why use Reuters, BBC, and TechCrunch?"*

6.2 The Answer: Infrastructure First

BICLE v0.1 is a transitional protocol, not a final destination.

We are building the **infrastructure** that enables decentralized journalism to exist.

Analogy:

- Bitcoin didn't eliminate banks overnight
- Email didn't eliminate postal services immediately
- TCP/IP didn't replace telephones instantly

But they created the infrastructure for alternatives to emerge.

6.3 Evolution Path

```
v0.1 → Aggregates existing sources + community submissions
       Creates immutable record
       Proves the concept works

v0.2 → P2P validation network
       Distributed nodes
       Consensus mechanism

v0.3 → NOSTR integration
       Decentralized identities
       Lightning Network (Bitcoin) for rewards

v1.0 → Fully decentralized production
```

```
Community-validated journalism
Independent reporters rewarded in Bitcoin
```

6.4 Current Value Proposition

Even with centralized sources, BICLE provides:

1. **Immutable Record**: Proves "this source said X at time Y"
2. **Tamper Evidence**: Any alteration is immediately detectable
3. **Auditability**: Anyone can verify the entire history
4. **Community Curation**: Anyone can submit news
5. **Infrastructure**: Foundation for future decentralization

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7. Future Development

7.1 v0.2 - P2P Network

Goal: Distribute the blockchain across multiple independent nodes.

Features:

- Node discovery protocol
- Blockchain synchronization
- Conflict resolution (longest valid chain)
- Redundancy (no single point of failure)

Technical:

```python
def sync_with_peers():
    for peer in known_peers:
        peer_chain = fetch_chain(peer)
        if len(peer_chain) > len(local_chain):
            if verify_chain(peer_chain):
                local_chain = peer_chain
```

7.2 v0.3 - NOSTR Integration

Goal: Leverage NOSTR for decentralized identities and content distribution.

Features:

- Users publish news with cryptographic signatures
- News propagates through NOSTR relays
- Identity tied to public/private key pairs
- Reputation system based on historical accuracy

NOSTR Event Format:

```
json

{
  "kind": 1,
  "content": "News content",
  "tags": [
    ["bicle", "news"],
    ["block", "42"],
    ["iHash", "a7f3c9e2..."]
  ],
  "pubkey": "...",
  "sig": "..."
}
```

7.3 v0.4 - Reputation & Incentives

Goal: Reward quality journalism with Bitcoin.

Features:

- Lightning Network integration
- "Zaps" (Bitcoin tips) for good journalism
- Reputation scores based on:
  - Community validation
  - Historical accuracy
  - Zaps received
- Algorithmic feed ranking by reputation

Economic Model:

```
Good journalism → More zaps → Higher reputation → More visibility → More zaps
```

7.4 v1.0 - Full Decentralization

Goal: Independent, community-run journalism network.

Features:

- Multiple specialized forks (Tech, Politics, Science, Health)
- Regional nodes (BICLE-US, BICLE-BR, BICLE-EU)
- Desktop/mobile applications
- Web interface
- API for third-party integration

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8. Use Cases

8.1 Journalism Verification

Scenario: A politician claims they "never said X."

Solution: Search BICLE blockchain for timestamped proof of statement.

8.2 Historical Archive

Scenario: A news article disappears from the web.

Solution: The article's hash and timestamp are permanently in BICLE.

8.3 Whistleblower Protection

Scenario: Anonymous source submits sensitive information.

Solution: Timestamped iHash proves information existed at specific time, protecting source.

8.4 Community Journalism

Scenario: Local event unreported by mainstream media.

Solution: Community member submits to BICLE, creating permanent record.

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9. Technical Comparison

9.1 BICLE vs Bitcoin

Feature	Bitcoin	BICLE
Purpose	Decentralize money	Decentralize information
Proof	Proof-of-Work (mining)	Proof-of-Information (hashing)
Block Content	Financial transactions	News items
Consensus	Longest valid chain	Longest valid chain (future)

Feature	Bitcoin	BICLE
Reward	BTC (block reward)	Reputation + zaps (future)
Storage	~500 GB blockchain	Lightweight (text only)
Speed	~10 min/block	~5 min/block (configurable)

9.2 BICLE vs Traditional News

Aspect	Traditional News	BICLE
Editability	Can be silently changed	Immutable
Deletion	Can be removed	Permanent record
Verification	Trust-based	Cryptographic proof
Censorship	Possible	Resistant
Ownership	Centralized platforms	Decentralized network
Transparency	Opaque algorithms	Open source

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10. Security Considerations

10.1 Attack Vectors

Spam Attack:

- **Threat:** Flooding with fake news submissions
- **Mitigation:** Rate limiting, community validation (future), reputation system

Chain Corruption:

- **Threat:** Malicious node distributing false blockchain
- **Mitigation:** Consensus mechanism (future), multiple nodes, cryptographic verification

Sybil Attack:

- **Threat:** Single actor creating multiple fake identities
- **Mitigation:** NOSTR integration (future), proof-of-stake reputation

10.2 Privacy

- BICLE does not store user data
- News sources are public (RSS feeds)
- Community submissions are pseudonymous (Telegram username)
- Future: NOSTR provides cryptographic identities without revealing real identity

11. Running a BICLE Node

11.1 Requirements

- Python 3.8+
- 100 MB storage (grows over time)
- Internet connection
- Telegram Bot Token (v0.1)

11.2 Installation

```bash
git clone https://github.com/bicle01/bicle-protocol
cd bicle-protocol
pip install -r requirements.txt
```

11.3 Configuration

Create `.env` file:

```env
TELEGRAM_TOKEN=your_token_here
CHANNEL_ID=your_channel_id
```

11.4 Running

```bash
python bicle.py
```

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12. Roadmap

Timeline (Subject to Change)

(Actual Version) BICLE v0.1

- [x] Genesis block
- [x] Basic blockchain implementation
- [x] Telegram bot interface
- [x] RSS aggregation

- [x] Community submissions
- [x] Integrity verification
- [x] Public release

Future - BICLE v0.2

- [ ] P2P node network
- [ ] Blockchain synchronization
- [ ] Distributed consensus
- [ ] Multiple node deployment

Future - BICLE v0.3

- [ ] NOSTR integration
- [ ] Cryptographic identities
- [ ] Lightning Network zaps
- [ ] Reputation system

Future - BICLE v0.4

- [ ] Web interface
- [ ] Mobile applications
- [ ] API for third-party integration
- [ ] Multiple topic categories

Future - BICLE v1.0

- [ ] Full decentralization
- [ ] Regional forks
- [ ] Advanced curation tools
- [ ] Production-ready release

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13. Contributing

BICLE is open source. We welcome contributions:

- **Code:** Bug fixes, features, optimizations
- **Documentation:** Tutorials, translations, guides
- **Testing:** Run nodes, report issues
- **News Curation:** Submit quality sources

GitHub: https://github.com/bicle01/bicle-protocol

License: MIT

14. Conclusion

14.1 The Vision

Imagine a world where:

- News cannot be silently deleted or edited
- Anyone can verify what was said and when
- Community validates journalism, not corporations
- Quality reporting is rewarded with Bitcoin
- No algorithm manipulates what you see
- Information flows freely, without censorship

That is BICLE's vision.

14.2 The Mission

Bitcoin decentralized money. BICLE decentralizes truth.

We are building the infrastructure for a future where information is:

- **Immutable** - Cannot be changed
- **Verifiable** - Anyone can check
- **Transparent** - No hidden algorithms
- **Censorship-resistant** - No single point of control
- **Community-driven** - Curated by users, not corporations

14.3 The Call to Action

Run a node. Contribute to the code. Submit news. Verify the blockchain.

Help build the future of information.

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15. References

1. Nakamoto, S. (2008). "Bitcoin: A Peer-to-Peer Electronic Cash System" - https://bitcoin.org/bitcoin.pdf
2. NOSTR Protocol Specification: https://github.com/nostr-protocol/nips
3. Lightning Network: https://lightning.network
4. Cryptographic Hash Functions (SHA-256)

Appendix A: Command Reference

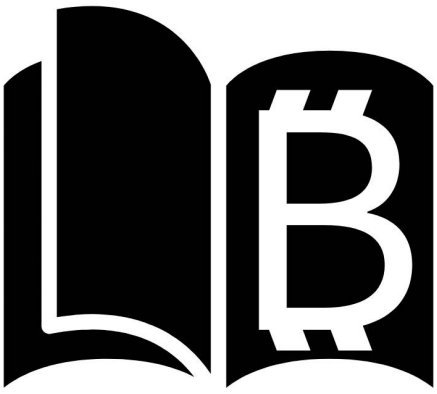
Command	Description
/start	Display bot information
/submit <link>	Submit news to pending pool
/mine	Mine a new block manually
/block <n>	View specific block
/hash	View last block hash
/proof	View recent blocks (proof of work)
/verify	Verify blockchain integrity
/export	Export blockchain as JSON
/stats	View source statistics
/status	View node status
/getid	Get chat/channel ID

BICLE v0.1 - The Decentralized Feed Protocol

"In cryptography we trust."

Date: November 7, 2025

Status: Experimental Release



License: MIT

Website: https://bicle.org (future)

GitHub: https://github.com/bicle01/bicle-protocol